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Mitigating Oilfield Impacts: The Eagle Ford Shale Part II: Pipelines

by Chase Currie

Last month's CKRWI Deer Associates eNews began a two part series focused on mitigating oilfield impacts in the Eagle Ford Shale. This edition of the eNews will cover mitigation and reclamation techniques associated with pipelines; whereas [Part I](#) focused on surface locations.

Pipelines

A pipeline constitutes a right of way in which flowlines are laid to transport oilfield products. In most cases, the oil companies will acquire an easement 30 feet in width, with an additional 20 feet for working room the entire length of the pipeline. However, depending on the size of the line installed, the width will vary. Below is an example of how to calculate surface damages associated with pipelines.

1) Length of Pipeline X Width of Easement = Square Feet Damaged

2) Square Feet Damaged ÷ Square Feet in 1 Acre = Acres Damaged

*Square feet in 1 acre = 43,560

Example using a pipeline 1 mile (5,280 ft) in length and a 50 ft easement:

1) 5,280 ft X 50 ft = 264,000 Sq. ft

2) 264,000 Sq. ft / 43,560 Sq. ft = 6.06 Acres

Although six acres does not seem like much, depending on your situation, the amount damaged could be substantial if you have numerous miles of pipelines crossing your property. Furthermore, if pipelines become a route for establishment of invasive plants, their impact could extend far beyond the area of direct disturbance.

Mitigation Process

As mentioned in Part I, a good surface use agreement is essential. If possible, plan for pipelines by developing a baseline separate from that of surface locations. When developing this baseline, consider the following sensitive areas: creek and river crossings, areas with steep slopes, large expanses of native plant communities, riparian zones, and historic landmarks. If possible, provide a map of suggested pipeline routes to the oil companies before the project begins. This simple step will make the mitigation planning process much easier.

Creeks and rivers are especially sensitive and you should negotiate to have the oil companies bore such areas. By boring riparian habitats, the surface is not damaged and you are able to save large trees and important plant species associated with these unique habitat types (Figure 1). Additionally, you do not affect the flow of water and in turn do not have the worry of potential erosion as a result of the pipeline. Riparian habitats are not the only areas that can be bored; keep an open mind in regards to saving important or historic areas of the ranch. A rock formation, unique trees, or a special landmark are other examples of areas that can be bored.

Figure 1. *Small riparian area that was bored to save the large persimmon and mesquite trees.*



If a pipeline route crosses a steep area where erosion is a concern, have the pipeline route seeded and then covered with soil erosion blankets to help establish vegetation and mitigate erosion.

The reclamation potential of a new pipeline route is more complex than that of a surface location. In most cases a surface location impacts one habitat and soil type, whereas a pipeline route may affect several. Keep this in mind as some areas of the pipeline route may require more attention than others. With any pipeline route, avoid highly productive, native plant communities. As mentioned in [Part I](#), the fastest way to reclaim an area is to not disturb it in the first place. Realize that a new pipeline route can be used to your advantage by positioning the route on a degraded range site, or through an exotic grass monoculture. The reclamation process can then be used to increase plant diversity and stabilize the plant community.

Consider the development of an “oil field corridor.” An oil field corridor is an area on your property of concentrated oil and gas activity which localizes disturbance and alleviates the degree of habitat fragmentation. A strip along a property boundary would be a good oil field corridor. This corridor in particular would concentrate all activity along your property boundary and thereby leave the interior of your property undisturbed. Furthermore, be aware of the position in which pipelines are laid within an easement. By positioning the first pipeline on one side of the easement, you leave room for future pipelines, and in turn the oil companies do not have to clear a new easement.

When possible, have pipeline routes parallel existing roads (Figure 2) rather than through an area of undisturbed habitat. By doing this, you limit the amount of habitat fragmentation associated with pipelines.

Figure 2. Pipeline under construction that parallels an existing ranch road.



Lastly, see if the oil companies can provide you with a “Master Plan” illustrating current and future pipelines to be installed. This will allow you to plan for reclamation. For example, by knowing the oil companies will lay multiple lines in one easement at different times, you can wait to reclaim the pipeline route once the last line is laid rather than having to reclaim the pipeline route multiple times. Furthermore, each time you re-disturb a pipeline route you run the risk of losing more topsoil and increase the chances of exotic grass establishment.

Reclamation Techniques

By being steadfast in the mitigation process, you increase your chances of success during reclamation. The most important step during the reclamation process is properly stockpiling as much topsoil as possible before installation of the pipeline. Since a pipeline route will cross different soil types, the depth of the topsoil will vary; therefore, the oil company will need to understand that the amount of topsoil to stockpile will fluctuate. It is important to be flexible and not have a set criteria as to how much topsoil must be

stockpiled. Some areas along the pipeline route may only have 4 inches of topsoil, whereas other areas may have 10 inches. All equipment used during the construction process should be steamed cleaned to prevent the spread of invasive plant species.

After completion of the pipeline, the stockpiled topsoil should be spread out evenly along the pipeline route. Erosion terraces or “water bars” should be installed at designated intervals along the pipeline route. The terraces reduce erosion by slowing the flow of water and diverting water off the pipeline. Spacing of the terraces will depend upon the slope of the pipeline route; the steeper the slope, the more terraces are required. Terraces should be wide and gradually rolling so they are passible by a vehicle, can be re-seeded easily, and are less likely to washout during a heavy rainfall. Steep, narrow terraces do not have such advantages.

When re-seeding the pipeline route, it is important to consider the different soil types along the route and adjust the native seed mix appropriately. Additionally, as stated in Part I, it is important to use the ecotypes of native plants associated with the region where your ranch is located. [South Texas Natives](#) and [Douglas King Seed Company](#) are great resources for native seed mixes compatible with south Texas. Also, don't be afraid to experiment with numerous native plant species in your seed mix because each situation is unique and the more diverse your seed mix, the more success you will have. Most importantly, try to plant from August 15-October 15. Previous research by South Texas Natives indicates that planting during this time is the most successful.

Lastly, have the oil company paint surface structures along the pipeline route a color that blends with the landscape. By doing so, the surface structures along the pipeline route appear more natural and are not an eye sore.

Monitoring

Prior to construction of a new pipeline route, take an inventory of the various soils and plant species currently existing along the route. Furthermore, take several photos within different soil types along the route so that you have a visual representation of the existing vegetation. Knowing the plant community both descriptively and visually along the pipeline route before construction will help you determine and monitor your reclamation success. Furthermore, with pre-construction vegetation data, you can determine if the new pipeline route aided in the establishment of exotic plant species. If exotic plant species were not present prior to construction, yet became established afterwards, the disturbance may have aided in establishment. Most importantly, you should monitor your reclamation success along the pipeline route over time. Periodic monitoring allows you to assess reclamation and make future adjustments. Establish photo points using metal t-posts along the pipeline route in various soil types. Take photos prior to, during and after reclamation (Figure 3).

Figure 3. *Photo point along pipeline before and during construction.*



Deer Management and Pipelines

Deer prefer edge habitats when foraging; therefore, pipelines have the potential to provide forage for deer. Incorporate pipelines into your deer management plan by choosing routes through an area that is in need of

habitat improvement rather than a diverse, native plant community. Additionally, pipelines may increase sightability of deer during the hunting season and can be good sites for hunting stands.

Pipelines associated with the Eagle Ford Shale are here to stay. By pre-planning prior to construction, being diligent in mitigating the impacts of pipelines, and properly reclaiming pipelines, the negative impacts of pipelines on wildlife and habitat will be manageable.

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